

PATROL PROPOSAL

2023

ABSTRACT

The substantial population growth in Canyon County over the past several years has generated a need to reexamine the staffing levels for patrol deputies within the Canyon County Sheriff's Office.



SHERIFF

Kieran Donahue
Sheriff

Douglas S. Hart
Chief Deputy

March 2023

Proposal for Additional Patrol Deputies

Canyon County's population growth during the past decade has created a significant increase in deputy workload, response times, and in the number of calls for service routed to the Sheriff's Office Patrol Division. The combined effect of these increases is such that there is a clear need to staff additional deputies on patrol. For a number of years, the Sheriff's Office had been unable to fill existing patrol vacancies and our patrol teams operated at below funded staffing levels. As of December 27, 2022, for the first time in many years, our four patrol teams are fully staffed at currently allocated levels of thirty-two patrol positions, divided into four teams of eight deputies per team.

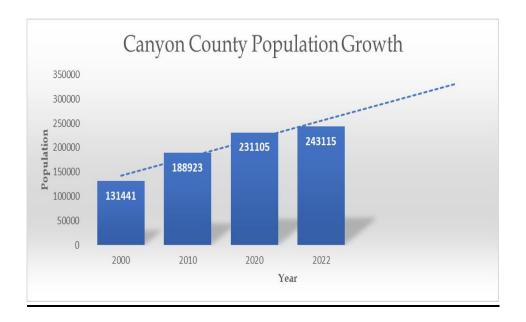
This proposal is intended to provide pertinent background information, research, and statistical analysis to demonstrate the need for increased staffing within the Sheriff's Office Patrol Division. Further, we will outline a plan that if adopted will substantially improve essential law enforcement services for our citizens by bringing staffing to adequate levels over the next four fiscal years (2024-2027). Staffing decisions are undoubtedly complex and costly for the county. It is our hope that the information contained herein will be useful to the Board of County Commissioners (BOCC) in future discussions with the Sheriff's Office to establish appropriate staffing levels for the Patrol Division.

Background

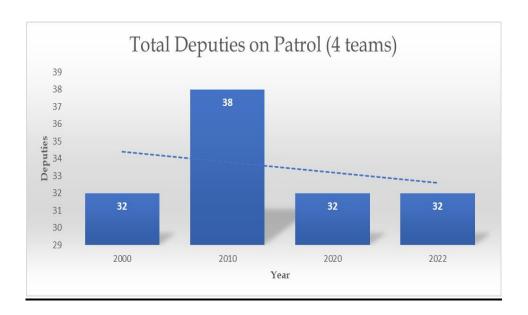
For several years, the Canyon County Sheriff's Office (CCSO) Patrol Division has operated with a structure of four teams; eight deputies per team/per shift. In 2010, an effort was made to bolster those numbers, and for a time there were two teams of nine deputies and two teams of ten deputies. Due to wage related turnover at that time, the need to staff a Pre-Trial Services team, and the mandate to fill additional deputy positions in the jail due to the construction of Pod 5 (2012 tent), deputy positions were moved from Field Services to Security Services and the patrol numbers were ultimately

decreased back to four teams of eight deputies. The current staffing level, based on the growth of the county, has resulted in placing a much greater demand on these patrol teams and individual deputies as the workload and calls for service have far outpaced our stagnant staffing level.

As with other sectors of society, population has a definite impact on law enforcement and the demand for our services. According to the U.S. Census website, Canyon County's population has grown 85% from 2000 to 2022 – a staggering increase. During this same time period, the number of CCSO Patrol Deputies decreased by approximately 16%. Reference the charts below.

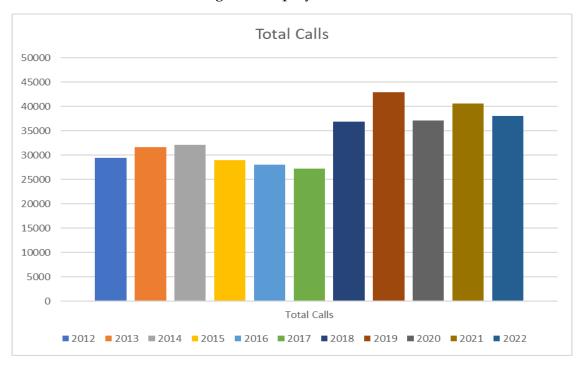


i



A key issue to highlight at the onset of this proposal is the impact that the population growth has had on the workload within the Patrol Division. There is an abundance of precise data on which we can rely to display the impact.

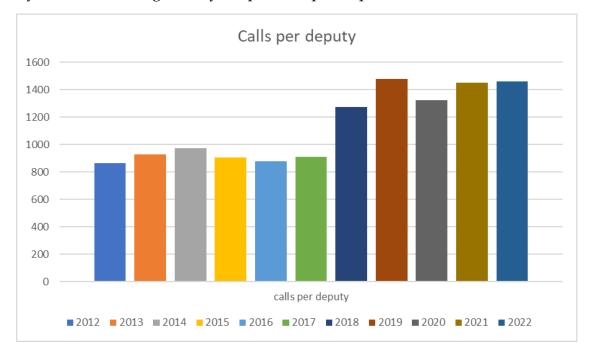
For the most part, a patrol deputy's workload is based on "calls" that come into the CCSO Dispatch Center. These calls are classified into three types based on the nature of the complaint or problem that is being reported (a more in-depth analysis based on call type will be addressed later on). For the purposes of this proposal, eleven years of CCSO call data were sought as displayed in the chart below



As can be clearly seen, the number of total calls routed to our patrol deputies from the Dispatch Center has increased significantly. From 2012 to 2017, the average number of calls per year was 29,563. From 2018 to 2022 that yearly average increased 32% to 39,109 calls per year. A 32% increase in calls can be attributed in large part to the 85% increase in Canyon County's population during the past twenty-two years. If we take a comparison from 2012 call numbers to 2019, our last pre-COVID year, the increase becomes 46%. What is more important to note is that the 32-46% increase in calls has resulted in an even larger percentage in increased workload for the Sheriff's Office patrol deputies. Due to staffing challenges in the past, and as displayed in the previous Patrol Staffing chart, the size of our Patrol Teams has not increased in step with the upsurge in the number of total calls, which determines the workload for our deputies.

It is essential to include a further analysis of this data in relation to the number of patrol deputies on CCSO's four patrol teams. The next chart shows the number of calls

assigned annually to each patrol deputy based on staffing of the patrol teams during those years, which was generally 6-7 patrol deputies per team.



Due to staffing shortages on our patrol teams for the past several years, the increase in total calls has resulted in an even larger number of calls per deputy. From 2012 to 2017, the average number of calls annually per deputy was approximately 900. From 2018 to 2022 the average number of calls annually per deputy was approximately 1,400 – a growth of 56%. This is a particularly troubling statistic. Now that we are fully staffed at eight deputies per team, this burden has been slightly reduced.

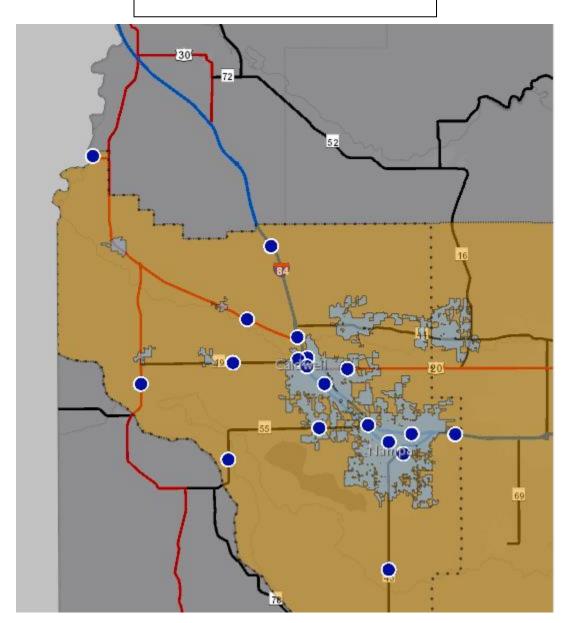
The Canyon County Sheriff's Office is obligated to respond appropriately to each call for service. The citizens and tax payers in the county expect and deserve top quality law enforcement services. These services often come at times of crisis in the lives of our citizens. A 32-56% increase in workload for each deputy during the past five years is a massive burden to bear. It places a considerable strain on the deputies, who already do a dangerous and stressful job. It impacts their readiness and elevates stress levels. Further, it drastically diminishes their ability to have any unobligated time (the concept of obligated and unobligated times will be explained in further detail later). Ultimately, it reduces and limits the services that the Sheriff's Office can and should provide to the citizens of Canyon County, and represents a very real potential to have a high liability consequence for the county.

Canyon County Traffic Growth Summary

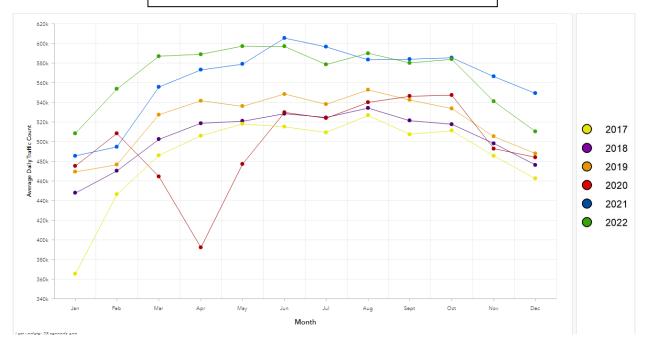
An important aspect of this proposal is the traffic growth within Canyon County. A substantial portion of the calls for service to which patrol deputies respond are traffic

related. Data on traffic growth is somewhat limited, but there are two sources we can site herein that provide valuable information and insight. The first is from the Idaho Department of Transportation.ⁱⁱ ITD archives Automatic Traffic Recorder (ATR) data month by month for the past five years within Canyon County. In the map presented below, each blue dot marks the location of an ATR camera that records traffic volume data. These 19 cameras are spread out in various locations throughout the county. The graph following the ATR camera location map contains a month by month display of the average daily traffic count (numerical traffic volume) recorded via the ATRs for Canyon County from 2017 to 2022.

ATR Camera Locations – Canyon County



Average Daily Traffic Count from ATR Cameras



The data in the graph above shows a sizable increase in the number of total vehicles on the roads within Canyon County as monitored by ATRs. The growth in the daily traffic count results in increased traffic accidents and other issues to which patrol deputies must respond. Additionally, it increases patrol deputy response times when traveling within the county to get to a call.

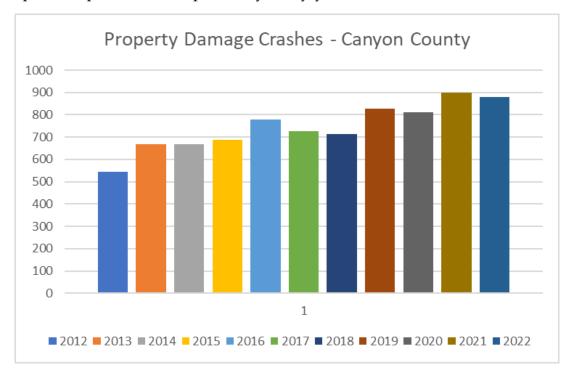
There are four different highway districts within Canyon County. Research conducted for this proposal resulted in finding only one Traffic Growth Study, which was from District 4. This study analyzed traffic volume on roads within District 4 (boundaries are found primarily in the Northeastern area of Canyon County, surrounding Caldwell) from 2005 to 2022. Not surprisingly, the study showed an overall average increase in traffic of 62% (total volume increase from 82,918 to 134,164). This roughly coincides with the 85% increase in population within the county. There were several roads noted in the growth summary where the average increase was over 200%. As with the ATR data, this Canyon Highway District study shows a surge in traffic numbers throughout the county. It is not reasonable to assume that the current staffing levels within our Patrol Division can effectively manage the increased traffic numbers throughout the county.

Traffic Crash Analysis

To demonstrate the impact of increased traffic numbers throughout the county, an analysis of eleven years (2012-2022) of vehicle crash data for motor vehicle incidents

assigned to CCSO patrol deputies was conducted. There are essentially three different classifications of motor vehicle crashes: Property Damage crashes, Personal Injury crashes, and Fatal crashes. Injury and Fatal crash numbers have remained fairly consistent over this period, which is likely associated with the improvement of safety features in vehicles over the past decade. By far, the most common type of motor vehicle crashes to which patrol deputies respond are Property Damage crashes.

The chart below displays the number of Property Damage crashes to which CCSO patrol deputies have responded, year-by-year from 2012 to 2022.



As can be seen in the chart above, the number of Property Damage crashes has increased substantially. From 2019–2022, the average number of crashes per year was 25% higher than the average number of crashes per year in the prior seven years. These calls take a considerable amount of time, and tie up multiple patrol resources per incident to investigate the crash and control traffic until the roadway can be restored.

Comprehensive Population Analysis Between Cities and Canyon County

Having examined the pertinent historical data regarding population growth, patrol staffing levels, the number of calls to which the Sheriff's Office must respond each year, traffic growth within the county, and motor vehicle crashes, it is important to break down the population by cities within the county in order to accurately determine the size of the population to which the Sheriff's Office is obligated to provide law enforcement services. Municipalities choose to become a city and tax citizens of the city for services. CCSO has jurisdiction over all cities and the county, whereas city police

cannot patrol outside of their city boundaries except in the event of exigent circumstances pursuant to mutual aid agreements. So, while cities within the county have the bulk of the county population, CCSO maintains jurisdiction and law enforcement responsibilities for all of the citizens of the county, whether they reside in the county or within city limits. By this broad interpretation, the population CCSO serves is 243,115 as of 2022.

From a narrower perspective, much of the county's population resides within the limits of the five cities that exist within Canyon County. Current population numbers reflect the following:

City	Population
Nampa	106,189
Caldwell	63,629
Middleton	10,169
Parma	2,114
Wilder	1,656
Total City Populations	183,754
County Population minus City Population	243,115 - 183,754 = <mark>59,361</mark>

The county population number of 59,361 represents the narrow "base" of the population serviced by the Sheriff's Office. However, this number is not an accurate reflection of the true number of citizens we serve, which is far greater. Residents of the five cities within the county, as well as a large number of other persons who travel through or do business in the county should be considered in the population we serve, as these individuals are often involved in the calls and incidents to which we respond. Further, there is considerable crossover between the cities and the county. County deputies often respond to back up city officers on higher threat calls and critical incidents. In Canyon County, Middleton, Parma, and Wilder are very small Police Departments that are frequently in need of law enforcement assistance from CCSO. These inter-agency interactions are a daily occurrence that genuinely increases the population served by the Sheriff's Office.

There is no exact science to estimate the true total population we serve, but conservatively it would be appropriate to take the narrow "base" population which is exclusive to Canyon County, and add an additional percentage to represent the added population that we serve by virtue of the circumstances explained above. Conservatively, we estimate this number at 10-15% of the total city populations. Rather than have a range, for the purposes of this proposal we will use the middle of those percentages (12.5%) to calculate the added population served by CCSO. This would

bring the "amended population" serviced by the Sheriff's Office to 82,330 (22,969[city] + 59,361[county]).

The key question in this entire analysis and proposal is:

How many patrol deputies are needed to adequately serve and protect the citizens of Canyon County?

Again, there is no exact science with which to answer this question, but several different entities have studied the question of law enforcement staffing levels and those studies have resulted in the development of multiple ratios for deputies/officers per thousand citizens. The ratios are generally different for cities versus counties, as cities are more densely populated. Rather than rely on any single ratio, we will reference a number of different ratios in use to arrive at potential patrol staffing figures for CCSO's patrol teams.

Ratios to Calculate Deputy Numbers Based on Population

Idaho, as an entire state, averages 2.4 deputies/officers per thousand citizens. iii This figure combines both cities, counties, and the state police. The FBI's Uniform Crime Report (UCR) cites that populations between 50,000 and 99,999 thousand citizens have an average of 1.3 deputies/officers per thousand citizens. A website entitled Governing: The Future of States and Localities, responded to the question of the appropriate ratio of deputies/officers to citizens. They calculated an average of 1.68 deputies/officer per thousand citizens. If we average the ratios from these three cited sources, it results in a ratio of 1.79 deputies/officers per thousand citizens. This number is supported by yet another source, COPS, which indicates that the average ratio in the Western part of the United States is 1.7 deputies/officers per thousand citizens. They would also include School Resource Officers (SROs), K-9 Handlers, Detectives, Civil Deputies, Marine Deputies, and so forth. Essentially all commissioned or sworn personnel within Field Services (this figure does not include Security Services, which is our jail and detention deputies).

Taking Canyon County's narrow population base of 59,361 and amended population base of 82,330, and applying a ratio of 1.7 deputies/officers per thousand citizens, the Sheriff's Office recommended staffing levels would be between 100 to 132 deputies. The patrol section accounts for approximately 60% of the commissioned deputies within the Field Services at the Sheriff's Office so these numbers would equate to between 60 to 79 patrol deputies. Divided by our four patrol teams it would be 15 to

19 deputies per patrol team. As a reminder, we are currently staffed at 8 deputies per patrol team.

The Sheriff's Office is not advocating to staff the Patrol Division at these levels. The most populous city within Canyon County is Nampa. The Nampa Police Department (NPD) currently operates with a ratio of 1.2 Officers per 1,000 residents. A total of 88 patrol officers man eight teams in the NPD patrol division. If CCSO were to adopt a lower ratio of .9 to 1.0 (based on more rural geography), using the amended population of 82,330, it would result in a Patrol Division of 44.5 to 49.4, or patrol teams of eleven to twelve deputies per team.

Detailed Analysis Based on CCSO Call Data

Another method can be used to answer the key question of how many deputies are needed. This method is more complicated, but potentially more accurate as it is based on actual call data generated from CCSO during the past two years, and presents a different way to calculate the appropriate number of deputies based on an analysis of the number and nature of calls and patrol shift hours. We will now navigate this analysis for CCSO to see the results of employing this particular method.

In 2021, Canyon County Sheriff's Office handled 40,623 calls, and in 2022 that number was slightly lower at 38,019. To more fully understand the workload, we need to break down the total number of calls for each year into call type. CCSO classifies calls into three categories:

<u>Type 1</u> calls are the most serious incidents to which patrol deputies respond such as injury accidents, shootings, homicide, suicides, DUI, lost child, and so forth. Type 1 calls take the most time to complete (four to six hours including response and report writing), and generally require anywhere from three to five patrol deputies on-scene.

<u>Type 2</u> calls are the next highest priority and will consist of calls for property damage crashes, burglaries, 911 open line calls, welfare checks, attempts to locate, and so forth. Type 2 calls take substantial time to complete (two to three hours including response and report writing), and generally require a minimum of two patrol deputies on-scene.

<u>Type 3</u> calls are the lowest priority calls which are agency assists, citizen assists, harassment, traffic hazards, and so forth. Type 3 calls take the least time to complete (45 minutes to an hour including report writing), and can be managed by a single patrol deputy.

The following chart contains a summary of call numbers by type for 2021 and 2022.

Call Type	2021 Call	2022 Call	Avg. Time per Call 2021	Avg. Time per Call 2022
	Numbers	Numbers	(aggregate of all call types)	(aggregate of all call types)
Type 1	1,826	1,909		
Type 2	23,725	22,156		
Type 3	15,072	13,954		
			01:44:55 (only on-scene	01:43:15 (only on-scene
Total	40,623	38,019	time; does not include	time; does not include
			report writing time; does	report writing time; does
			not account for multiple	not account for multiple
			deputy time)	deputy time)

The times and the numbers from the chart above are perhaps the best data available for the most precise analysis of patrol staffing needs within the county. The time that patrol deputies spend on the calls as noted above represents the <u>time onscene</u>. It does not reflect the time required to then document the actions taken by the patrol deputy, to transport, process and submit evidence to the crime lab, download body and dash camera video, route reports to supervisors, de-brief with other patrol deputies, transport arrested subjects to jail, testify in court, and so forth. The time that it takes to perform all of these functions is referred to as "**obligated time**." The chart above shows only a portion of obligated time; the on-scene time spent in responding to a call for service.

There is a second time component to each patrol deputy referred to as "unobligated time." Unobligated time is used for self-generated activity and pro-active policing such as surveillance on a known drug house, traffic stops, follow-up with citizens in ongoing matters, community-oriented policing, crime deterrence, and also for deputy breaks. The chart above does not account for any unobligated time.

The below noted calculations show the total number of on-scene hours based on the information in the Call Chart.

2021: 40,623 (calls) x 105 (avg. min. per call) / 60 (min. per hr.) = 71,090 on-scene hours

2022: 38,019 (calls) x 103.25 (avg. min. per call)/60 (min. per hr.) = 65,424 on-scene hours

As previously mentioned, there are many duties a deputy performs in obligated time that are not reflected in on-scene hours, as well as the need for unobligated time. Conservatively, it would be reasonable to add 35 - 50% to the on-scene hours to account for the time these additional duties take to complete and close out their assigned calls. This would then provide a total for hours needed to complete all of the patrol deputy duties during these years based solely on call data as shown below.

2021: 71,090 (on-scene hours) x 1.35 (35%) = 95,972 total hours
71,090 (on-scene hours) x 1.50 (50%) = 106,635 total hours
2022: 65,424 (on-scene hours) x 1.35 (35%) = 88,322 total hours
65,424 (on-scene hours) x 1.50 (50%) = 98,136 total hours

To use these total hours to determine the number of patrol deputies needed to cover the calls, we divide the total hours by 2,184 (annual hours per deputy – based on 12 hour shifts at CCSO). The resulting number is the total number of patrol deputies needed, and we then divide that number by four to arrive at the number of deputies needed to staff each patrol team based on actual call data.

2021: 95,972 (total hours)/2,184=43.94 patrol deputies needed/4 teams= 11 patrol deputies per team 106,635 (total hours)/2,184=48.82 patrol deputies needed/4 teams= 12.2 patrol deputies per team
2022: 88,322 (total hours)/2,184=40.44 patrol deputies needed/4 teams= 10.1 patrol deputies per team 98,136 (total hours)/2,184=44.93 patrol deputies needed/4 teams= 11.2 patrol deputies per team

The analysis of actual call data demonstrates that CCSO patrol teams should be staffed at eleven to twelve deputies per patrol team; we are currently staffed at eight per team. The question will inevitably come up regarding how the patrol teams have managed the number of calls with teams of eight or less. As was indicated earlier, the workload per deputy has increased approximately 32-56% in the past five years. A partial explanation of how we manage the larger workload is that our patrol deputies have been working overtime, cutting call times as short as possible, stretching themselves very thin, skipping breaks and meals, etc. in order to complete their assigned duties. Additionally, the 35-50% to on scene time is an estimate. Sometimes that estimate will be higher, and at other times lower, which would then cause the total hour numbers to fluctuate. These calculations are estimates, but are based on the best numbers and data we have to provide a statistical basis (along with other data previously presented) for the need to increase patrol staffing. What is most important to know is that ultimately the increased workload results in deputies that are experiencing fatigue, having to work and write reports at an undue pace (which can mean mistakes and insufficient documentation of important events), and cutting other important duties just to handle the higher call volume. The rise in workload significantly increases the potential for a deputy to make a mistake, and in this profession, mistakes can be deadly and are accompanied by high liability.

Further, and noteworthy, is that under our current staffing of eight deputies per patrol team, there is literally no time for self-generated activity, or unobligated time. This is a detriment to the citizens of the county. If a citizen calls with a complaint about

traffic enforcement, drug activity at a residence, suspicious activities in the neighborhood, etc., our patrol deputies simply don't have the time required to provide these basic services to our citizens. Increasing the staffing on our patrol teams is the only solution.

Staff Growth Analysis for CCSO

Finally, it is vitally important to note the absence of CCSO patrol team growth in years past. In looking at this data, unfortunately it is clear that the patrol team staffing has not remotely kept pace with the growth of the county. Prior to 1997, each of the four patrol teams was staffed at six deputies per team, for a total of 24 patrol deputies. From 1997 to 1998, patrol positions were added to bring the teams from six deputies to eight deputies. As shown in the chart at the beginning of this proposal, for a period in/around 2010 additional positions were added to increase staffing to between nine and ten patrol deputies per team, but this lasted only for a short time until those positions were, out of necessity, shifted to Security Services and the patrol teams returned to staffing levels of eight deputies per team. Essentially, with the exception of the aforementioned period in 2010, patrol teams have been staffed at eight deputies per team since 1998 – a period of twenty-five years.

Cost Analysis

Clearly a major component of these decisions is both the fixed and ongoing cost of funding a new patrol deputy position. Any deputy will have variable ongoing salary costs as they achieve annual step increases within our current pay scale until they reach the maximum pay for their position (after 11 years). It is difficult to account for every cost associated with adding a new position, but the below noted analysis is an accurate estimate of fixed and ongoing costs.

<u>Fixed Costs</u> (one-time costs associated with a new patrol deputy position), based on FY2023 numbers.

- 1. Vehicle: \$83,000 (vehicle plus all accessories)
- 2. Mobile Dispatch Computer (MDC): \$1,900
- 3. Patrol Rifle (w/optics and light): \$2,500
- 4. Pistol (w/optics and light): \$1,000
- 5. Taser: \$1,700
- 6. Body Camera: \$600
- 7. Body Armor: \$900
- 8. Radio: \$7,000
- 9. Miscellaneous Equip: \$900 (IFAK, Go-Bag, etc.)

Approximate Total Fixed: \$99,500 per deputy

On-going Costs (recurring costs each fiscal year), based on FY2023 numbers.

- 1. Salary: \$72,259 (at 4-year deputy; will have step increases annually)
- Training: \$500
 Ammunition: \$300
- 4. Clothing/Uniform Allowance: \$350

Approximate Total On-going/Increasing Annually: \$73,409 per deputy

A few things are noteworthy as it relates to cost. Every patrol deputy needs a vehicle, but not every patrol deputy will be issued a new vehicle. CCSO works closely with County Fleet to budget for new vehicles and recycle the old patrol vehicles on an annual basis. Ultimately, each patrol deputy needs a patrol vehicle. Additionally, the cost of a new vehicle with all required accessories will vary, likely increasing in cost from year to year. The other equipment will have smaller annual variances, and account for a much lesser portion of the fixed costs.

Implementation

Our plan for staffing any additional patrol positions should also be highlighted. The majority of our commissioned deputies start in the jail. This gives them valuable experience in law enforcement and they learn many beneficial lessons that will be of use to them when they move to patrol. Not every detention deputy wants to go to patrol, but each year we conduct testing to create a roster of detention deputies that are seeking to transfer to patrol. As is well known to the BOCC, in years past we experienced a high rate of turnover in the jail as detention deputies chose to leave in order to pursue jobs with higher wages and opportunities to go to patrol with other agencies. Some of these deputies did not see the opportunities for a patrol transfer within CCSO coming available to them in a timely manner. The wage issue no longer exists with the new wage scale passed by the BOCC in December 2022. This wage increase has dramatically improved our recruiting and retention within CCSO.

In December 2022, we transferred four detention deputies to patrol in order to fully staff the four patrol teams. We are strongly committed to continuing this pattern. Currently CCSO uses the "Hoover" Police Training Officer (PTO) training program for both detention training and patrol training. Within the Hover PTO model, the essential skills required to perform police functions were categorized into fifteen Core Competencies, developed through a comprehensive job task analysis. Of the fifteen Core Competencies taught to detention deputies, fourteen of them are identical to those taught to patrol deputies. By building off of the skills already learned and used in detention, our new patrol deputies that transfer from the jail are operating far beyond what one would typically find in a new patrol officer.

It is our intention to retain the talented employees we recruit and hire by staffing new additional patrol positions from the jail. We want to give these employees an opportunity to advance their careers in law enforcement while remaining with CCSO. We will back-fill those transfers with new hires that start in the jail, so essentially all of our new hires will be in the jail. This plan ensures that the citizens of Canyon County derive the benefit of well trained and experienced deputies who have dedicated their law enforcement careers to Canyon County. There may be times, on a case by case basis, where we would hire a "lateral," which is a trained, certified, commissioned law enforcement officer who is coming from another law enforcement agency. This, however, would be an infrequent circumstance in which that person brings a strong background of relevant experience and talent to CCSO.

Conclusion and Recommendations

It is the opinion of the Sheriff's Office that our patrol teams need to grow to the point of having twelve deputies per team, for a total of forty-eight patrol deputies. This represents a total of sixteen new patrol deputy positions. While we need those bodies in place today, we believe that the most efficient way to implement this growth is to add four patrol deputy positions (new PCNs for new positions) per fiscal year for the next four years (FY 2024 – FY 2027). This would spread the cost of adding new staff over a four-year period, and enable us to manage the growth within our Patrol Division effectively. As the county population will continue to increase year by year, growing our patrol teams to twelve deputies per team by the end of FY 2027 will keep pace with county population growth and ensure that the Sheriff's Office Patrol Division is sufficiently staffed. These recommendations are made using conservative numbers and represent staffing levels needed to bring us to minimal number of patrol deputies to adequately serve the citizens of Canyon County.

Additionally, as the county population continues to grow, it is incumbent upon the BOCC and the Sheriff's Office to more frequently assess CCSO staffing compared to population increases in order to ensure staffing is at the proper levels to meet the needs of the citizens. Thank you for your time and consideration of this proposal.

References

¹ https://www.census.gov/quickfacts/fact/table/canyoncountyidaho/AGE295221

ii https://experience.arcgis.com/experience/9adadaf53a7a436aa835f45b17fb6927

iii https://usafacts.org/articles/police-departments-explained/

^{iv} https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/tables/table-71

^v https://www.governing.com/archive/gov-cities-police-officers-hiring.html

vi https://cops.usdoj.gov/ric/Publications/cops-p247-pub.pdf

NOTES